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PAR 211

30 Nov 64

SUBJECT: Microdensitometer Study of Effects of Processing

TASK/PROBLEM

1. Collect and study microdensitometric data from mission materials in an attempt to determine the effects of film emulsions, processing, and printing on the characteristics of image edges. Also, attempt to determine true location of image edges for mensuration purposes.

DISCUSSION

2. Data was collected on low-contrast resolving power, acutance, granularity, and modulation transfer of Types 4400, 4401, and 4404 films under standard Trenton three-condition processing and in four special low graininess or high-sharpness developers. To facilitate acutance measurements, the microdensitometer was modified to permit direct card punching of the density data. This data is reduced in the IBM 1620 or 7044 computers through the use of computer programs written during this quarter. IBM 7044 programming is preferred for the advantages offered in speed and efficiency versus the IBM 1620 computer.

3. Briefing aid designs are in preparation for use in describing this project.

4. A literature search and preliminary investigations were made on the problem of the mensuration of photographic images at the limit of resolution. This is the difficult problem of distinguishing a signal almost buried in noise, and appears so far to have only partial solutions. The variables of lens aberrations, uncompensated image motion, and haze add to the grain of the film in smearing edge, so that it seems necessary to characterize the edge spreading as a fundamental stage of mensuration.

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5. The customer has shown interest in adding medium contrast (6.3:1) resolving power to the other image quality measurements made on the films having processing variations. Also, he would like to have aerial scene simulations made at 1:300,000; 1:100,000; and 1:23,000 (only two scales were included in the original proposal). Quotations are being prepared to show the cost of including these two additions to the contract.

PLANNED ACTIVITIES

6. Data collection continues on the image quality of films having fine grain and high resolving power processing.

7. Briefing aid designs will be completed and submitted to the customer for approval.

8. Cost estimates will be prepared on the inclusion of medium contrast resolving power as one of the image quality tests, and a third scale (1:23,000) as one of the scales used in making scene simulations.

9. The mensuration study will be continued.

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